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1110.01 General

- | The Headquarters (HQ) Bridge and Structures Office provides structural design services to the regions. This chapter describes the information required by the HQ Bridge and Structures Office to perform this function.

1110.02 References

Bridge Design Manual, M 23-50, WSDOT

Plans Preparation Manual, M 22-31, WSDOT

1110.03 Required Data for All Structures

- | Submit the bridge site data to the HQ Bridge and Structures Office. Provide a cover memo that gives general information on the project, describes the attachments, and transmits the forms and data included in the submittal. Submit site data as a CAD file, supplemental drawings, and a report. See Figure 1110-1 for items to include in a bridge site data submittal. Direct any questions relating to the preparation of bridge site data to the HQ Bridge and Structures Office. The *Bridge Design Manual* shows examples of required WSDOT forms.

(1) CAD Files and Supplemental Drawings

- | The HQ Bridge and Structures Office uses the microGDS Computer-Aided Drafting (CAD) system. CAD files prepared for use as bridge site data will be accepted in standard DGN, DXF, or DWG format.

Prepare plan, profile, and section drawings for all structures. Include copies of the CAD site data and supplemental drawings in the reduced plan sheet format with the submittal.

Use a complete and separate CAD file for each structure. See the *Plans Preparation Manual* for information regarding drawing levels and use the Bridge and Structures format. The *Bridge Design Manual* contains examples of completed Bridge Preliminary Plans. These plans show examples of the line styles and drawing format for site data in CAD.

Include the following information in the CAD files or in the supplemental drawings:

(a) Plan

- Drawing scales for the bridge site plan:

Length of Structure	Scale
20 ft to 100 ft	1"=10'
100 ft to 500 ft	1"=20'
500 ft to 800 ft	1"=30'
800 ft to 1,100 ft	1"=40'
more than 1,100 ft	1"=50'

The bridge site data is used to prepare the bridge layout plan which is to be used in the contract plans. The drawing scales shown are for the full-sized contract plan format and are a guide only. Consider the width and general alignment of the structure when selecting the scale. For structures on curved alignments or where the bridge width is nearly equal to or greater than the bridge length, consult the HQ Bridge and Structures Office for an appropriate plan scale.

- Vertical and horizontal datum control. See Chapters 1440 and 1450.
- Contours of the existing ground surface. Use intervals of 1, 2, 5, or 10 ft depending on terrain and plan scale. The typical contour interval is 2 ft. Use 1 ft intervals for flat terrain. Use 5 ft or 10 ft intervals for steep terrain or small scales. Show contours beneath an existing or proposed structure and beneath the water surface of any waterway.
- Alignment of the proposed highway and traffic channelization in the vicinity.
- Location by section, township, and range.

- Type, size, and location of all existing or proposed sewers, telephone and power lines, water lines, gas lines, traffic barriers, culverts, bridges, buildings, and walls.
- Location of right of way lines and easement lines.
- Distance and direction to nearest towns or interchanges along the main alignment in each direction.
- Location of all roads, streets, and detours.
- Stage construction plan and alignment.
- Type, size, and location of all existing and proposed sign structures, light standards, and associated conduits and junction boxes. Provide proposed signing and lighting items when the information becomes available.
- Location of existing and proposed drainage.
- Horizontal curve data. Include coordinates for all control points.

(b) Profile

- Profile view showing the grade line of the proposed or existing alignment and the existing ground line along the alignment line.
- Vertical curve data.
- Superelevation transition diagram.

(c) Section

- Roadway sections on the bridge and at the bridge approaches. Indicate the lane and shoulder widths, cross slopes and side slopes, ditch dimensions, and traffic barrier requirements.
- Stage construction roadway geometrics with the minimum lane and roadway widths specified.

(2) Report

Submit DOT Form 235-002, "Bridge Site Data-General." Supplement the CAD drawings with the following items:

- Vicinity maps
- Class of highway
- Design speed

- Special requirements for replacing or relocating utility facilities
- ADT and DHV counts
- Truck traffic percentage
- Requirements for road or street maintenance during construction

(3) Video and Photographs

Submit a VHS video of the site. Show all the general features of the site and details of existing structures. Scan the area slowly, spending extra time showing existing bridge pier details and end slopes. A "voice over" narrative on the video is necessary for orientation.

Color photographs of the structure site are desirable. Include detailed photographs of existing abutments, piers, end slopes, and other pertinent details for widenings, bridge replacements, or sites with existing structures.

1110.04 Additional Data for Waterway Crossings

Coordinate with the Headquarters (HQ) Hydraulics Branch and supplement the bridge site data for all waterway crossings with the DOT Form 235-001, "Bridge Site Data for Stream Crossings" and the following:

- Show riprap or other slope protection requirements at the bridge site (type, plan limits, and cross section) as determined by the HQ Hydraulics Branch.
- Show a profile of the waterway. The extent will be determined by the HQ Hydraulics Branch.
- Show cross sections of the waterway. The extent will be determined by the HQ Hydraulics Branch.

The requirements for waterway profile and cross sections may be less stringent if the HQ Hydraulics Branch has sufficient documentation (FEMA reports, for example) to make a determination. Contact the HQ Hydraulics Branch to verify the extent of the information needed. Coordinate any rechannelization of the waterway with the HQ Hydraulics Branch.

Many waterway crossings require a permit from the U.S. Coast Guard. (See Chapter 240.) Generally, ocean tide influenced waterways and waterways used for commercial navigation require a Coast Guard permit. These structures require the following additional information:

- Names and addresses of the landowners adjacent to the bridge site.
- Quantity of new embankment material within the floodway. This quantity denotes, in cubic yards, the material below normal high water and the material above normal high water.

Some waterways may qualify for an exemption from Coast Guard permit requirements if certain conditions are met. See the *Bridge Design Manual*. If the waterway crossing appears to satisfy these conditions, then submit a statement explaining why this project is exempt from a Coast Guard permit. Attach this exemption statement to the Environmental Classification Summary prepared for the project and submit it to the HQ Design Office for processing to FHWA.

The region is responsible for coordination with the HQ Bridge and Structures Office, U. S. Army Corps of Engineers, and U. S. Coast Guard for waterways that may qualify for a permit exemption. The HQ Bridge and Structures Office is responsible for coordination with the U.S. Coast Guard for waterways that require a permit.

1110.05 Additional Data for Grade Separations

(1) Highway-Railroad Separation

Supplement bridge site data for structures involving railroads with the following:

(a) Plan

- Alignment of all existing and proposed railroad tracks.
- Center-to-center spacing of all tracks.
- Angle, station, and coordinates of all intersections between the highway alignment and each track.
- Location of railroad right of way lines.

- Horizontal curve data. Include coordinates for all circular and spiral curve control points.

(b) Profile

- For proposed railroad tracks; profile, vertical curve, and superelevation data for each track.
- For existing railroad tracks, elevations accurate to 0.1 ft taken at 10-ft intervals along the top of the highest rail of each track. Provide elevations to 50 ft beyond the extreme outside limits of the existing or proposed structure. Tabulate elevations in a format acceptable to the HQ Bridge and Structures Office.

(2) Highway-Highway Separation

Supplement bridge site data for structures involving other highways by the following:

(a) Plan

- Alignment of all existing and proposed highways, streets, and roads.
- Angle, station, and coordinates of all intersections between all crossing alignments.
- Horizontal curve data. Include coordinates for all curve control points.

(b) Profile

- For proposed highways; profile, vertical curve, and superelevation data for each.
- For existing highways; elevations accurate to 0.1 ft taken at intervals of 10 ft along the center line or crown line and each edge of shoulder, for each alignment, to define the existing roadway cross slopes. Provide elevations to 50 ft beyond the extreme outside limits of the existing or proposed structure. Tabulate elevations in a format acceptable to the HQ Bridge and Structures Office format.

(c) Section

- Roadway sections of each undercrossing roadway indicating the lane and shoulder widths, cross slopes and side slopes, ditch dimensions, and traffic barrier requirements.
- Falsework or construction opening requirements. Specify minimum vertical clearances, lane widths, and shy distances.

1110.06 Additional Data for Widenings

Bridge rehabilitations and modifications that require new substructure are defined as bridge widenings.

Supplement bridge site data for structures involving bridge widenings by the following:

- Submit DOT Form 235-002A, “Supplemental Bridge Site Data-Rehabilitation/Modification.”

(a) Plan

- Stations for existing back of pavement seats, expansion joints, and pier center lines based on field measurement along the survey line and each curb line.
- Locations of existing bridge drains. Indicate whether these drains are to remain in use or be plugged.

(b) Profile

- Elevations accurate to 0.1 ft taken at intervals of 10 ft along the curb line of the side of the structure being widened. Pair these elevations with corresponding elevations (same station) taken along the crown line or an offset distance (minimum of 10 ft from the curb line). This information will be used to establish the cross slope of the existing bridge. Tabulate elevations in a format acceptable to the HQ Bridge and Structures Office.

Take these elevations at the level of the concrete roadway deck. For bridges with latex modified or microsilica modified concrete overlay, elevations at the top of the overlay will be sufficient. For bridges with a nonstructural overlay, such as an asphalt concrete overlay, take elevations at the level of the concrete roadway deck. For skewed bridges, take elevations along the crown line or at an offset distance (10 ft minimum from the curb line) on the approach roadway for a sufficient distance to enable a cross slope to be established for the skewed corners of the bridge.

1110.07 Documentation

A list of documents that are to be preserved [in the Design Documentation Package (DDP) or the Project File (PF)] is on the following website: <http://www.wsdot.wa.gov/eesc/design/projectdev/>

**Review Chapter 1110 of the *Design Manual*
for further information and description of the items listed below.**

PLAN (In CAD file.)

- ☐ Survey Lines and Station Ticks
- ☐ Survey Line Intersection Angles
- ☐ Survey Line Intersection Stations
- ☐ Survey Line Bearings
- ☐ Roadway and Median Widths
- ☐ Lane and Shoulder Widths
- ☐ Sidewalk Width
- ☐ Connection/Widening for Traffic Barrier
- ☐ Profile Grade and Pivot Point
- ☐ Roadway Superelevation Rate
(if constant)
- ☐ Lane Taper and Channelization Data
- ☐ Traffic Arrows
- ☐ Mileage to Towns Along Main Line
- ☐ Existing Drainage Structures
- ☐ Existing Utilities — Type/Size/Location
- ☐ New Utilities — Type/Size/Location
- ☐ Light standards, Junction boxes,
Conduits
- ☐ Bridge Mounted Signs and Supports
- ☐ Contours
- ☐ Bottom of Ditches
- ☐ Test Holes (if available)
- ☐ Riprap Limits
- ☐ Stream Flow Arrow
- ☐ R/W Lines and/or Easement Lines
- ☐ Exist. Bridge No. (to be removed,
widened)
- ☐ Section, Township, Range
- ☐ City or Town
- ☐ North Arrow
- ☐ SR Number
- ☐ Scale

TABLES (In tabular format in CAD file.)

- ☐ Curb Line Elevations at Top of
Existing Bridge Deck
- ☐ Undercrossing Roadway Existing
Elevations
- ☐ Undercrossing Railroad Existing
Elevations
- ☐ Curve Data

OTHER SITE DATA (May be in CAD or may be on
supplemental sheets or drawings.)

- ☐ Superelevation Diagrams
- ☐ End Slope Rate
- ☐ Profile Grade Vertical Curves

- ☐ Coast Guard Permit Status
- ☐ Railroad Agreement Status
- ☐ Highway Classification
- ☐ Design Speed
- ☐ ADT, DHV, and % Trucks

FORMS (Information noted on the form or
attached on supplemental sheets or drawings.)

Bridge Site Data General

- ☐ Slope Protection
- ☐ Pedestrian Barrier/Pedestrian Rail
- ☐ Height Requirements
- ☐ Construction/Falsework Openings
- ☐ Stage Construction Channelization Plans
- ☐ Bridge (before/with/after) Approach Fills
- ☐ Datum
- ☐ Video of Site
- ☐ Photographs of Site
- ☐ Control Section
- ☐ Project Number
- ☐ Region Number
- ☐ Highway Section

Bridge Site Data for Stream Crossings

- ☐ Water Surface Elevations and Flow Data
- ☐ Riprap Cross Section Detail

Supplemental Bridge Site

Data-Rehabilitation/Modification

BRIDGE, CROSSROAD, AND APPROACH
ROADWAY CROSS SECTIONS

(May be in CAD or separate drawings.)

- ☐ Bridge Roadway Width
- ☐ Lane and Shoulder Widths
- ☐ Profile Grade and Pivot Point
- ☐ Superelevation Rate
- ☐ Survey Line
- ☐ PB/Pedestrian Rail Dimensions
- ☐ Stage Construction Lane Orientations
- ☐ Locations of Temporary Barrier
- ☐ Conduits/Utilities in Bridge
- ☐ Location and Depth of Ditches
- ☐ Shoulder Widening for Barrier
- ☐ Side Slope Rate

Bridge Site Data Check List

Figure 1110-1